HUMAN PERFORMANCE RESEARCH & DEVELOPMENT

Presented by

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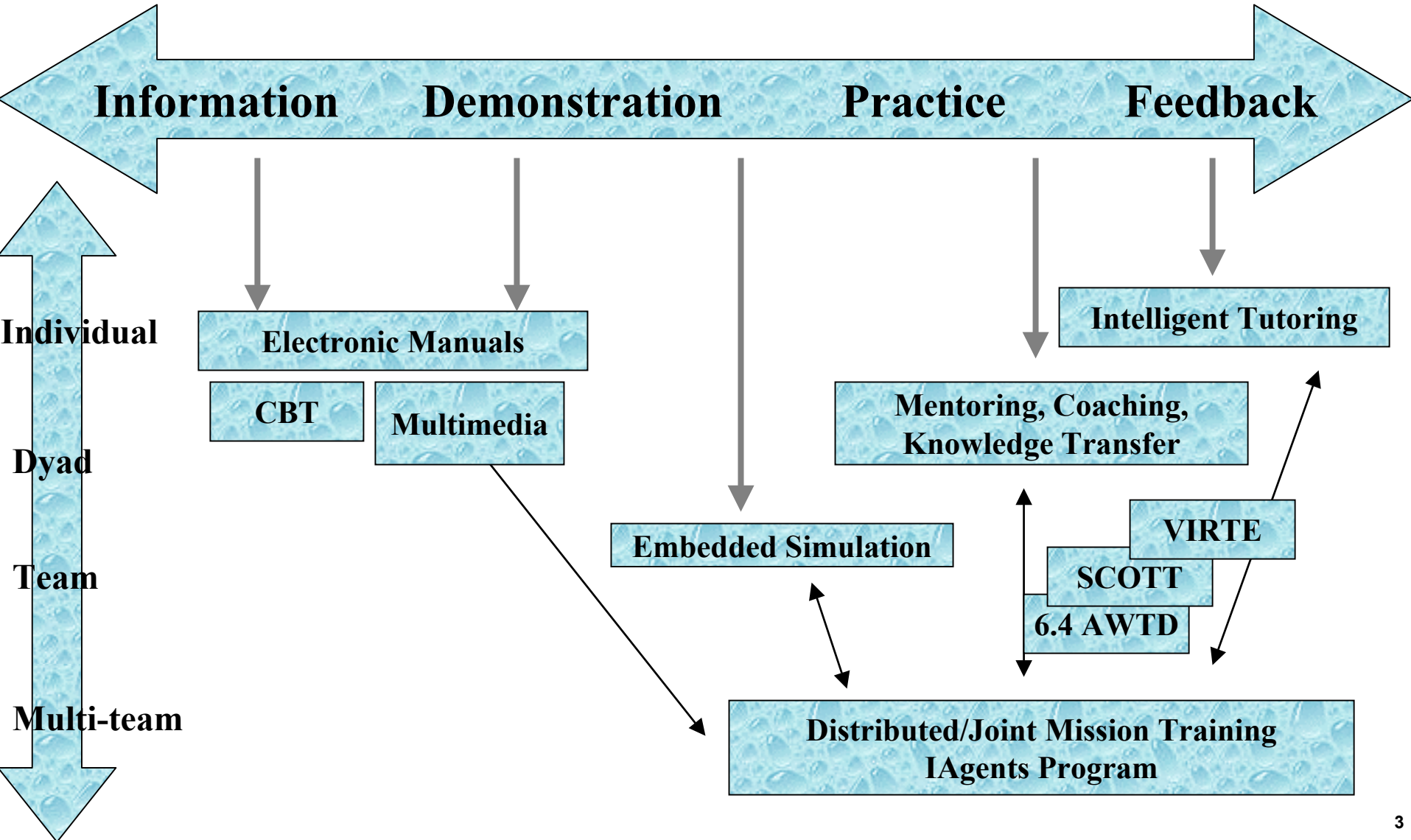
Presentation Outline

- Human Performance & Assessment Learning Continuum
- Current ONR Human Performance R&D efforts underway at NAVAIR Orlando
  - Performance Measurement Authoring Tool
  - Debriefing Distributed Teams
  - Advanced Technologies for IETM Development & Delivery
  - Intelligent Agents for Real-Time Modification of Large Scale Exercises
  - Guidelines and Methods for Employing Computer-Based Distance Learning

Human Performance & Assessment: Learning Continuum



Human Performance & Assessment: Program Overview

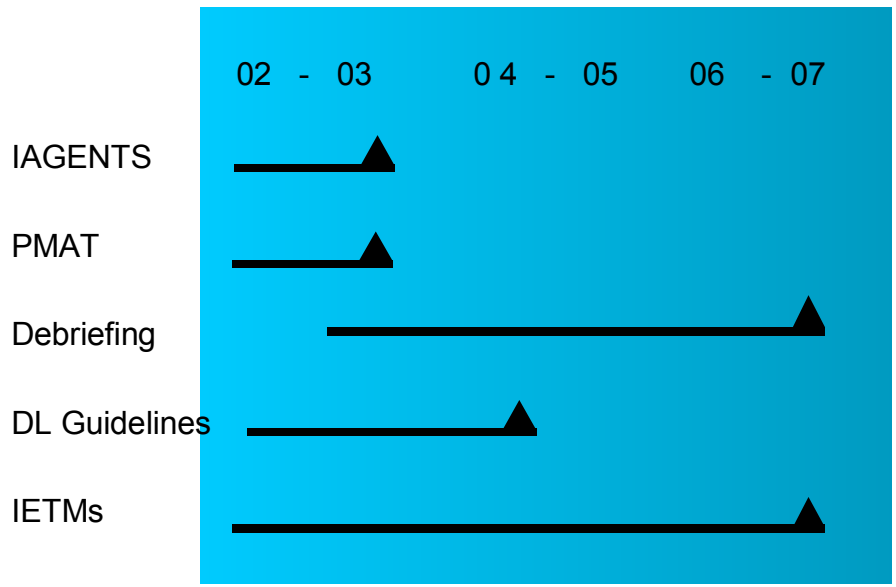
Operational Capability Gap:

- 30 – 40% attrition in existing distance and distributed learning courses
- Non-existent guidance for design of team training distance and distributed learning courses
- Current electronic documentation lacks sound user-centric design and fails to exploit computer processing capabilities.

Metrics:

- Guidance for design of team training distance and distributed learning courses is routinely provided with a subsequent improvement in team performance of 50%.
- Reduce time to perform O-level corrective maintenance tasks 20% and obtain technician preference 10-to-1 compared to current technology.
- Authoring tool for generating valid measures of performance that will reduce the time required to create valid measures of performance by 25% and will increase the reliability and validity of fleet-developed measures by 30%.
- Distance and distributed learning course attrition reduced to 10% and learning levels are improved by 50%.

"...dramatically increase the use and effectiveness of onboard training/simulation packages and computer-based distance learning...that will enrich Sailors throughout their careers, helping them realize their full personal and professional potential"



Authoring Tools for Rapid Development of Human Performance Measures

Product Description:

A computer-based tool that aids Fleet users to:

(1) translate training objectives into measurable events,
(2) select appropriate metrics for those events, and
(3) author effective measurement plans and instruments.

Planned Transitions:

- PMA 205, NASMP/AWTD
- PMS 430, BFTT

Warfighting Payoff:

- Reduce cost of providing effective feedback
- Reduce the number of persons required to conduct scenario-based training
- Reduce the required qualifications of exercise controllers and scorers
- Enhance the quality, timeliness, & effectiveness of feedback

Debriefing Distributed Simulation-based Exercises

Product Description:

Automated system for collecting real time human performance measures via semi-automated & automated measurement systems, diagnosing distributed team performance deficiencies, synthesizing debriefing information into an optimal format for presentation, and producing debriefings for distributed multi-platform exercises.

Identified Deficiencies

- Data loss
- Single Platform Assessment
- Laborious Exercise Monitoring
- Informal Diagnosis
- Aggregating Data for Diagnosis
- Lack of Structure in Debrief
- Delayed Debriefs

Identified Solutions

- System that Collects Valid and Reliable Semi Automated & Automated Performance Assessments
- System that Diagnoses Distributed Individual and Team Performance Deficiencies
- System that uses Instructional Principles to Produce Debriefs for Distributed Exercises

Planned Demos/Transitions:

- Advanced Warfare Training Development (6.4), PMA205, FY03
- Battle Force Tactical Trainer, PMS430, FY05 & FY06

Warfighting Payoff:

- Improved readiness for distributed platforms
- Improved training for distributed platforms by:
  - Delivering the right information quickly
  - Presenting the information in an optimal format
- More efficient use of training time & resources
  - Less time to prepare distributed debriefs
  - Less manpower to prepare distributed debriefs
  - Intelligent agents for performance diagnosis

Intelligent Agents for Real-Time Scenario Modification

Product Description:

- A set of intelligent software processes and training technologies to be used by trainers, controllers, and exercise managers to support the design and execution of Category 3 joint exercises.
- Tools to help optimize joint training time; optimize manning

Planned Demos/Transitions:

- JSIMS AEO, FY04
- Joint Training and Analysis Center, FY04

Warfighting Payoff:

- More effective and efficient learning and management of joint exercises
- More complete and accurate training feedback
- Instructionally sound exercises supported by increased quantity, quality, and timeliness of training performance data.

Advanced Technologies for IETM Development and Delivery

Product Description:

Advanced capabilities for Interactive Electronic Technical Manuals (IETMs) and strategies for ensuring enhanced usability. Improved search and navigation, performance support and training, user interfaces and I/O devices.

Planned Transitions:

- PMS 317L

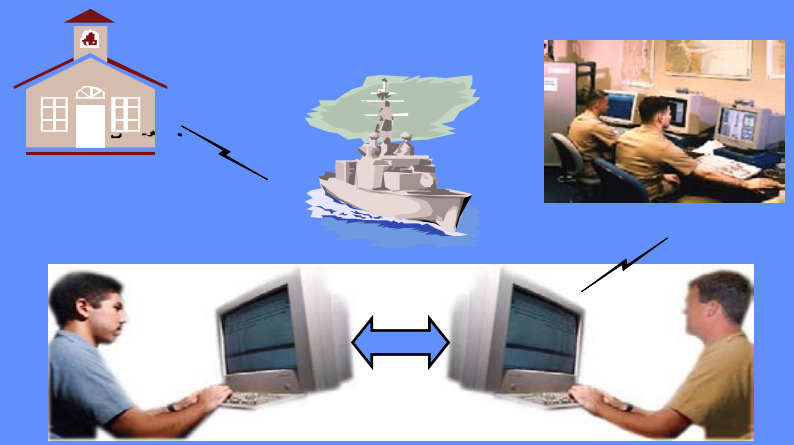
Warfighting Payoff:

- Human performance solutions for Interactive Electronic Technical Manual performance support and training;
- Substantial cost savings related to reductions in time for maintenance tasks.

Computer-based Distance Learning Employment and Instructor Training Guidelines

Product Description:

Guidelines for *employing* computer-based distance learning designed for the unique characteristics of the Navy and USMC



Planned Demos/Transitions:

- USMC-TECOM, FY04
- Naval Education and Training Command, FY04

Warfighting Payoff:

- DL designed to suit the Navy and USMC unique characteristics
- Faster, more efficient use of fleet training technology investment
- Reduction in time to achieve required competencies

Employing Computer-Based Distance Learning

Title: Guidelines and Methods for Employing Computer-based Distance Learning (CDL)

Sponsor: ONR Capable Manpower FNC Program

Customers/Transition Agents: NETC and MCDLC

Duration: 1/02 through 1/05 (FY02-FY04)

Goals:

- Understand main factors affecting *successful employment* of CDL in US Navy and USMC
- Provide CDL stakeholders with knowledge and tools to help achieve effective CDL employment

Navy has made organizational commitment to computer-based distance and distributed learning (CDL): how can we ensure success?

Background: Study Methods

1: Study multiple examples of CDL employment

What was/is the outcome? What contributed to successful and problem aspects?

Use open-ended interviews, in-depth site visits, direct observation of use of CDL-based training.

2: Identify common processes, effects and leverage-points

What are predictable problems? proven solutions?

General method to plan for and manage the employment process.

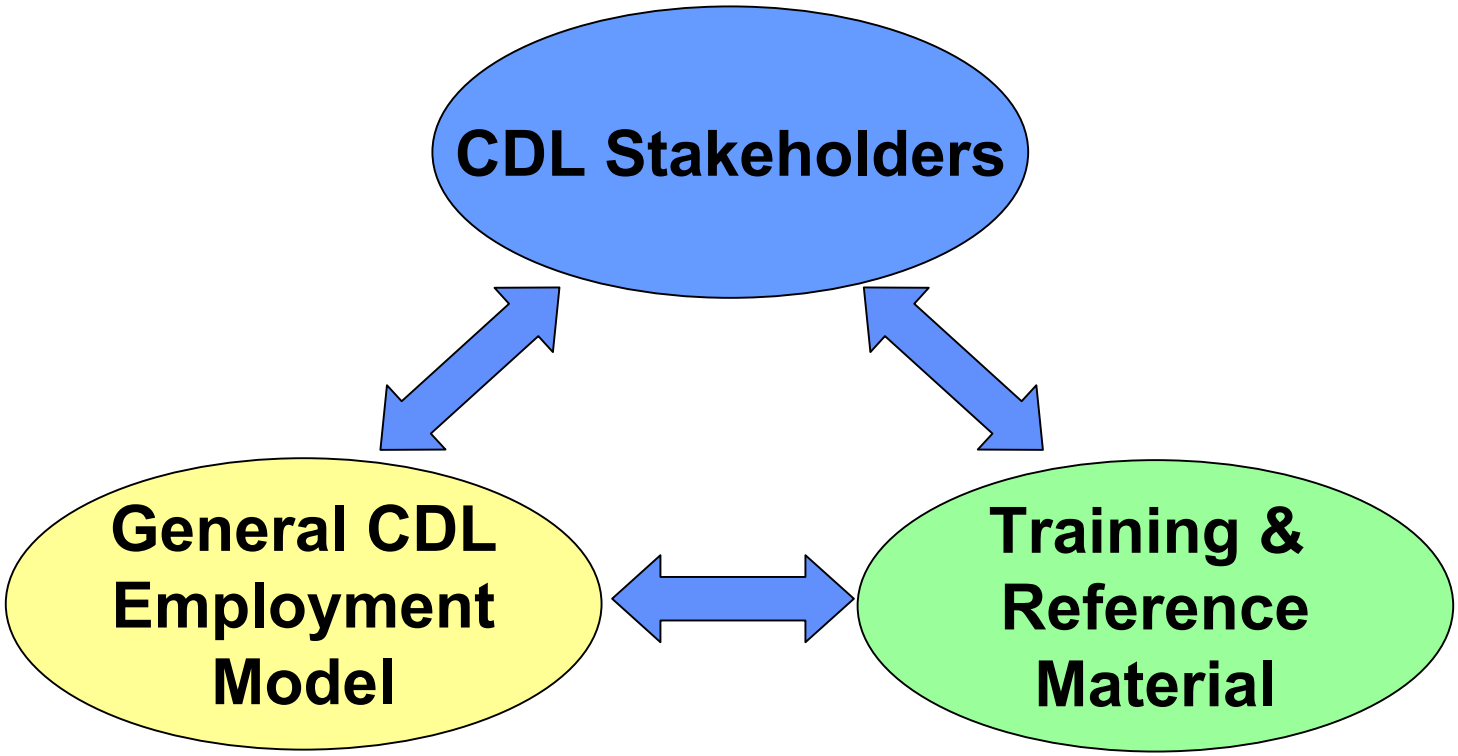
3: Create and distribute employment training support tools

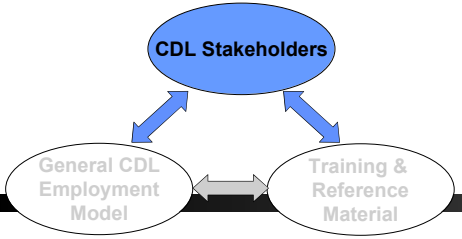
Who are the stakeholders? What should they do to engineer successful deployment and employment of CDL courses and curricula?

Guidelines capturing general method/rules, and case studies (examples) capturing real-world experiences.

Distribute and Promulgate

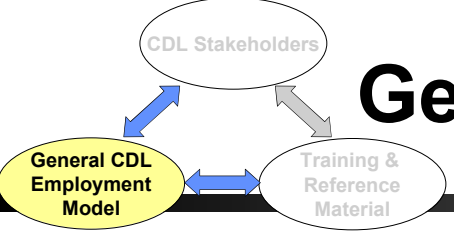
CDL Employment 'Big Picture'





CDL Stakeholders

- **CDL Creation**
  - Managing activity
  - Content developer
  - Software designer/developer
  - CDL maintainer
- **CDL Use**
  - Site/Unit/Ship Commander
  - Training supervisor/instructor(s)
  - Trainee's supervisor
  - IT/ET/technology support at user-site
  - Trainee



General CDL Employment Model

Stakeholders in CDL Creation

Analyze for Employment Issues

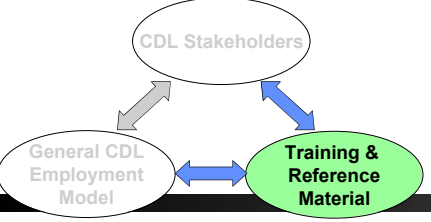
Design, Develop, CDL to Address Emplym't Issues

ID & Meet Secon-dary Train-ing Needs

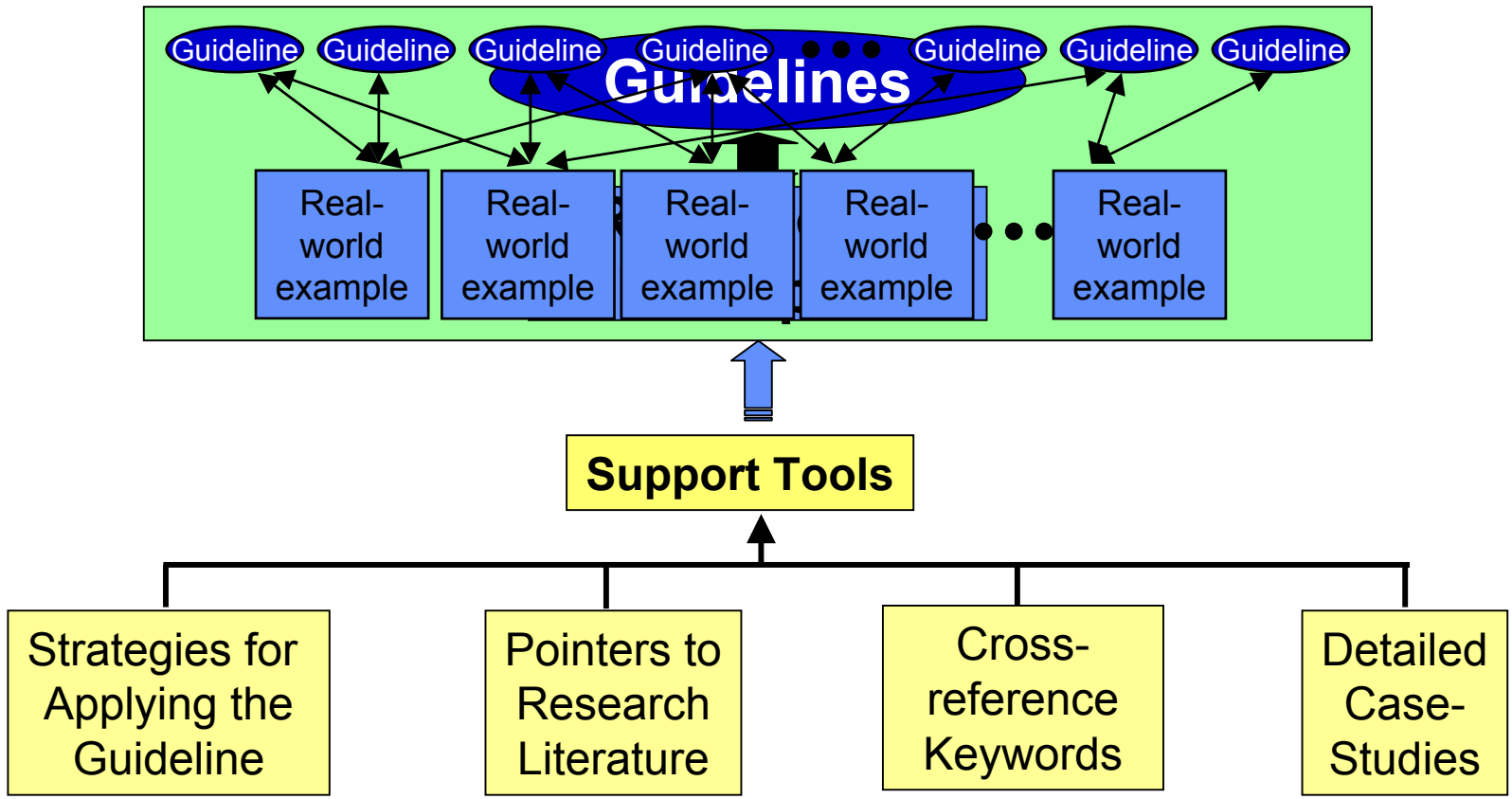
ID & Meet Organi-zational CDL Support Needs

Manage User-Creator Stakeholder Relationship

Stakeholders in CDL Employment & Use



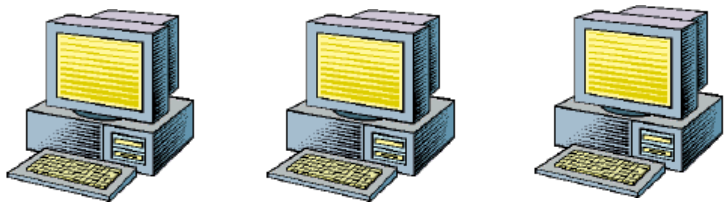
CDL Employment Training & Reference Material



Example 1:

Guidelines and Case Studies to help select a learning approach

CDL Resource Availability



Guideline: Analyze training environment to ensure that CDL resources are sufficiently accessible to all learners.

- # computers, required bandwidth etc.
- availability to learners (e.g., priority of uses, hours of operation/availability, etc.)

Case Study: Too few technological resources precludes CDL course from meeting training needs

- Hundreds of trainees, 20 or so computers
- Limited technological accessibility

impedes employment process for CDL program.

Mulilenburg, L. Y. & Berge, Z. L. (2001) Barriers to distance education: A factor-analytic study. *The American Journal of Distance Education. 15(2):7-22.*

McCollum, C. (2003). *Importance of employment strategy to ADL success: A case study.* Paper to be presented at the Interservice-Industry Training & Education conference, Orlando, FL.

Non-content Benefits of Traditional Training

Guideline: Assess non-content benefits of traditional schoolhouse training

- Participation in schoolhouse courses may provide learners with valuable outcomes related to personal and professional development (e.g., peer networking, feeling rewarded)

Case Studies:

- Important learner experiences at schoolhouse (financial management, peer networking, dating)
- Time spent at a training facility is considered a reward; CDL environment makes some personnel feel less valued.

Strategies: Assess experiences learners have both within and outside the classroom. Provide mechanisms to meet those goals (e.g., non-CDL experiences to supplement the CDL).

How does this broaden their perspective?

How does this expand their network of contacts?

Do the learners consider this training opportunity an incentive or reward?

Example 2:

Guidelines and Case Studies to help design for effective employment

Instructor Learner Communication

Guideline: Ensure that CDL technology allows 2-way instructor-learner communication.

- Sustained, 2-way communication (instructor-learner) may be needed.
- Alternative communication channels must allow for effective conveying and receiving of material.

Case Studies:

- Email correspondence is sufficient with most learners, but inadequate for those struggling with math component of the course.
- Telephone and real-time chat used in a synchronous CDL environment to provide tutoring and coaching to learners.

Strategies:

- At a minimum, email (or other technology) must allow learners to ask questions and receive answers
- If demonstration needed (e.g., calculations) communication channels should enable real-time interactions (e.g., telephone, streaming two-way audio, VTC)

Range of CDL Resources

Guideline: Anticipate that CDL products may be installed and operated in a broad range of technology.

- Operational settings often technologically unstable and inconsistent
- Must design CDL to work in a range of technological environments infrastructures

Case Studies:

- DL curriculum distributed to entire user community at same time, many technical impediments to deployment.
- Training community “rolled-out” in phases, resolved most technical issues before full distribution.
- Distance learning center exercises full control; smooth rollout process

Strategies:

- Analyze the actual technical resources in a broad sample of operational environments.
- Design/test based on this range of variability.
- Consider rolling-out in phases and address the unexpected before entire distribution.

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